

Effects of Two Different Oral Anti Diabetic Drugs in Type 2 Diabetes Mellitus Patients

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ABSTRACT

Objective: To examine and compare the effects of oral antidiabetic drugs in type 2 DM patients.

Design: Prospective and comparative study.

Place and duration of study: Study was conducted at the department of Pharmacology, Basic Medical Sciences Institute (BMSI) in collaboration with Medical Department, Jinnah Postgraduate Medical Centre (JPMC) Karachi, from January 2006 to July 2006.

Patients and methods: After scrutinized sixty newly untreated type 2 Diabetes Mellitus patients were enrolled in this study. Females and Males patients were divided in two groups. In group-I (n=27) patients were treated with drug pioglitazone 15mg after meal. In group-II (n=33) patients were treated with drug glibenclamide 5mg early morning just before breakfast. Patients with peptic ulcer, renal diseases, hepatic diseases, blood diseases, any serious complications were excluded from this study. General Physical examination, pulse, blood pressure, routine investigation etc, was recorded at the time of patients enrollment and same assessments was taken at day 45 and at day 90. Fasting and Random Blood Sugar was calculated by Glucose-Oxidase Enzymatic method. The data were expressed as the Mean±SEM at the end of study and was analysis by paired "t" test.

Results: Out of seventy type 2 diabetes mellitus patients , 60 patients were completed over all study period, tables shows the base line and post treatment values when results were summed up and the test parameters was compared , it was observed that drug glibenclamide decreasing blood sugar level in type 2 diabetes mellitus in a given time period. In parameter FBS mg/dl at day 45 mean values were 165.04 ± 8.98 P-value was P > 0.05 (non-significant), in parameter RBS mg/dl at day 45 mean values were 279.78±13.63 P-value was P>0.05 (non-significant), with pioglitazone group I patients. Glibenclamide group II patients, in parameter RBS (mg/dl) at day 45 mean values were 220.12±13.39 P-value from day 0 to day 45 was P < 0.005 (Moderate significant), in the end of study period when results were compared visible differences was observed among in both groups . With glibenclamide group II in parameter FBS mg/dl at day 90 mean values were 140.06 ± 5.68 P-value from day 0-90 was P<0.001 Highly significant.

Conclusion: Drug glibenclamide controlled type-2 diabetes mellitus by decreasing blood sugar level in a given study period as compared with other our study drug pioglitazone.

Key words: Insulin receptors. Sulfonylureas, PPAR γ ligands. KCNJ 11 mutations.

INTRODUCTION

Diabetes mellitus is a group of syndromes characterized by hyperglycemia; altered metabolisms of lipids, carbohydrates and proteins¹. Diabetes mellitus type 2 formerly non insulin dependent diabetes mellitus or adult onset diabetes is a metabolic disorder that is characterized by high blood glucose in the context of insulin resistance and relative insulin deficiency². The main etiological risk factors for type 2 diabetes are age, obesity family history, physical inactivity , and dietary factors³. The vascular abnormalities leading to atherosclerosis in patients with diabetes⁴. Several recent studies have shown that hyperglycemia as well as many of the defects characterizing glucose metabolism in patients with type 2 diabetes⁵. Ideally, public health measures are needed to prevent the onset of type 2 diabetes⁶. It has now become obvious

that type 2 diabetes must be taken every bit as seriously as type 1 diabetes⁷. Thus type 2 diabetes is progressive, combinations of treatments are routinely needed⁸. The low cost and ready availability of SU's to the state make it a popular agent in the management of type diabetes mellitus⁹. Pioglitazone, a TZD commonly used in the treatment of type 2 diabetes¹⁰ Pioglitazone that are also high affinity PPAR γ ligands¹¹. TZDs increase peripheral insulin sensitivity via a partially elucidated mechanism¹². Studied the effect of pioglitazone, a thiazolidinedione that reduces the insulin resistance on the atherogenic lipoprotein profile in individuals with type 2 diabetes¹³. To a public reporting measure of excellent glycemic control applicable to all persons with DM enrolled in health care systems.¹⁴ Dietary habits, BMI, Smoking, medication and dietary supplements were obtained from careful personal interview¹⁵. All above subjects had to meet the similar criteria to be included in our this given current study.

MATERIAL AND METHODS

After scrutinized only 60 patients newly untreated, Type II Diabetes Mellitus (NIDDM) Patients were selected in this study out of 70 Patients, 10 patients discontinued to take drug due to side effects and low compliance. Remaining 60 patients were completed over all study period. This Study was conducted at the department of Pharmacology and therapeutic Basic Medical Sciences Institute Jinnah Postgraduate Medical Centre Karachi with collaboration Medical Department. Patients were selected from Filter Clinic (OPD) of Medical Department from January 2006 to July 2006. Patients were divided in to two groups in group I having (n=27) patients, in group II (n=33) patients newly untreated Type 2 Diabetes Mellitus of either Sexes males and females having different ages ranges from 02 to 70 years. Patients with peptic ulcer, cardiac diseases, hepatic diseases, blood disorders any serious complicated diseases were excluded from this study. Initially history and detail clinical examination was taken from all the participants. After explaining the limitations and related information to patients written consent was obtained from all patients. The main study period was consisted on 90 days, with fortnightly follow up visits. The required information such as name, age, sex, occupation, address, previous medications, surgery, date of follow up visits etc, of each participants was recorded on the written proforma especially designed for this research. All the base line investigations was taken on the day of enrollment in the study day 0, and similar assessments was taken on the day 45 and at day 90 as per research design and protocols. After fulfilling all necessary initial requirements of patients in group I prescribed drug pioglitazone 15 mg once daily dose given after meal, group II patients were treated with

glibenclamide 5mg drug once daily early morning just before break fast for over all study period. Patients were called for check up of blood pressure, pulse, weight, general physical appearance and laboratory tests, patients was reassured after listening their point of view. Drug compliance to the regimen was monitored by interview and counseling at each clinical visit. No titration of dosage of drug was required during study period. FBS and RBS was calculated by "Glucose-Oxidase" Enzymatic Method. Specimen was collected for blood sugar in disposable 5cc syringe under aseptic environments. Data were expressed as the Mean \pm SEM and 't' test was applied to determine statistical significance as the difference. Probability value of "<0.05" was the limit of significance.

RESULTS

Out of seventy type 2 diabetes mellitus patients, 60 patients were completed over all study period tables shows the base line and post treatment values when results were summed up and the test parameters was compared, it was observed that drug glibenclamide decreasing blood sugar level in type 2 diabetes mellitus in a given time period. With pioglitazone group I patients in parameter FBS mg/dl at day 45 mean values were 165.04 \pm 8.98 P-value was P > 0.05 (non – significant), in parameter RBS mg/dl at day 45 mean values were 279.78 \pm 13.63 P-value was P > 0.05 (non- significant). With glibenclamide group II patients, in parameter RBS (mg/dl) at day 45 mean values were 220.12 \pm 13.39 P-value from day 0 to day 45 was P < 0.005 ** (Moderate significant), at the end of study period when results were compared visible differences was observed among in both groups. With glibenclamide group II in parameter FBS mg/dl at day 90 mean values were 140.06 \pm 5.68 P-value from day 0 to day 90 was P < 0.001*** (highly

significant). We obtained (highly significant) results from glibenclamide group II patients at the end of given study period.

Table 1: Changes in parameters fasting and random blood sugar at day 0 and at day 45 with P-value on pioglitazone group I (n=27) Patients

Parameters	At day 0	At day 45	P-value
			day 0- 45
FBS (mg/dl)	172.7±13.32	165.04±8.98	>0.005
RBS (mg/dl)	285.11±15.32	279.78±13.63	>0.05

Key : n = indicates number of patients in a given group.± indicates standard error of mean . P value: >0.05 (non significant).

Graph-1: Changes in Parameters Fasting and Random Blood Sugar at day 0, at day 45 and at day 90 on glibenclamide group II (n=33) patients.

Key n : Different number of patients in a given group. FBS: Fasting Blood Sugar. RBS: Random Blood Sugar.

Table 2: Changes in parameters fasting and random blood sugar with P-value on glibenclamide group II (n=33) patients

Parameter	At day 0	At day 45	P-value
			day 0 45
FBS (mg/dl)	188.42±12.05	168.45±10.99	>0.05
RBS (mg/dl)	284.18±17.03	220.12±13.39	<0.005**

Key : n indicates number of patients in a given group. ± indicates standard error of mean. P-value <0.005** (moderate significant).

Table 3: Changes in parameters fasting and random blood sugar at day 0 , and at day 90 with P-value on glibenclamide group II (n=33) patients

Parameters	At day 0	At day 90	P-value
			day 0-90
FBS (mg/dl)	188.42±12.05	140.06±5.68	<0.001***
RBS (mg/dl)	284.18±17.03	170.94±5.80	<0.001***

Key: n: indicates number of patients in a given group. ± indicates standard error of mean. P-value <0.001*** highly significant.

DISCUSSION

Objective of our study was planned to examine and compare the effects of two different oral anti-diabetic drugs in type 2 diabetes mellitus patients among both groups. Patients shows better results in decreasing blood glucose level during and at the end of study period. In parameter RBS mg/dl at day 45 mean values were 220.12 ± 13.39 P-value from day 0 to day 45 was $P < 0.005^{**}$ (moderately significant) results of our study were correlate with the study results of Campbell A¹⁶, however few differences was obviously present in both studies. In parameter FBS mg/dl at day 90 mean values were 140.06 ± 5.68 P-value from day 0 to day 90 was $P < 0.001^{***}$ (highly significant) and in parameter RBS mg/dl at day 90 mean values were 170.94 ± 5.80 and its P-value was $P < 0.001^{**}$ (highly significant) at day 90. These our study results were correlate with the study results of Lehtihet M et al¹⁷, according to their study glibenclamide stimulated insulin exocytosis is partly ATP – sensitive K^+ (K_{ATP}) independent and PKC dependent * $P < 0.05$, ** $P < 0.01$ and *** $P < 0.001$ for chance differences vs controls by student's t-test.

Re Pratley et al¹⁸, study explained adjunct treatments to metformin, in individuals with type 2 diabetes who did not achieve adequate glycaemic control with metformin alone, we keeping in our study similar type of setup, for controlling blood glucose level by using two different oral anti-diabetic drugs. Miyazaki Y et al¹⁹, examined the effect of pioglitazone on abdominal fat distribution to elucidate the mechanisms via which pioglitazone improves insulin resistance in patients with type 2 diabetes mellitus. Similar effect was examined from one of our current given study drug pioglitazone in group I patients. Calhoun DA et al²⁰, study was not correlate with our study, differences between both studies was in their diseases of patients and their drugs applications. Sulfonylurea therapy is safe in the short term for patients with diabetes caused by KCNJ 11 mutations and is probably more effective than insulin therapy. This remarkable conclusion given after the completion of research work which was done by Pearson ER et al²¹, which also favour our given current study drug glibenclamide.

Conclusion: Drug glibenclamide controlled type 2 diabetes mellitus by decreasing blood sugar level in a given study period as compared with other our study drug pioglitazone.

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